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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/561,102

06/02/2006

Michael V. Paukshto

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EXAMINER

VU, PHU

ART UNIT

PAPER NUMBER

2871

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/561,102

Applicant(s)

PAUKSHTO ET AL.

Examiner

PHU VU

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-85/86)
Paper No(s)/Mail Date 2/6/2006, 10/3/2007
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “207” figure 2 has been used to designate both angle between transmission axis 202 of front polarizer and reference and reference axis 201 and angle between the rubbing direction 205 of the front alignment layer and reference axis 201. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. Suggested correction is change “207” to “209.”

Specification

The disclosure is objected to because of the following informalities: Element “207” has been used to designate both angle between transmission axis 202 of front polarizer (see and reference and reference axis 201 and angle between the rubbing direction 205 of the front alignment layer and reference axis 201. Appropriate correction is required. Suggested correction change 207 to 209.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 14 and 30 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As described above, what exactly is optimized by the set of layers is unclear and even what set of layer are being optimally selected is unclear.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 9-11, 15, 17, 25-27, and 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al US Patent No. 5838408 further in view of Bobrov et. al. (IDS 2/6/2006)

Regarding claims 1, 9-11 and 15 Inoue discloses a liquid crystal device where the angle rubbing direction of the front alignment layer and front polarizer to be 25 to 65 degrees (see figure 19 A and column 31 lines 35-43). Inoue also discloses angle between second polarizer and alignment layer with an angle of 35 to 55 degrees. The reference discloses

angles that are substantially the same as the angles in claim 1 and 17 where the angle between the front polarizer and rubbing direction of the front polarizer is 22 to 50 degrees and the between the second is 40 to 68 degrees. The twist angle disclosed by Inoue is 240 degrees. Regarding claims 17, 25-27 and 31 the angle between the first polarizer and rubbing direction of the corresponding layer is 40 to 68 degrees and it is 40 to 68 for the second polarizer and rubbing direction of the second alignment layer well. The reference shows the same configuration wherein the angle between the first polarizer and rubbing direction of the first alignment layer is 25 to 65 degrees and the angle between the second polarizer and rubbing direction of the second alignment layer is 35 to 55 degrees (see figure 19B and column 31 lines 35-43). Inoue discloses use of these angles provides optimal color tone at zero voltage (see abstract). Since significant overlap exists between the angles between the polarization axis and rubbing direction for the first and second polarizers, the limitations of claims 1 and 17 are obvious over the reference. See MPEP § 2144.05 [R-1] overlap of ranges. The only limitation the reference does not disclose is a thin crystal film polarizer of negative birefringence and use of thin crystal film polarizers in liquid crystal displays. Brobov discloses a thin crystal film polarizer lower light leakage, a higher contrast ratio, a reduction in size and increased efficiency (see Brobov 139). According to the specification “ thin crystal films possess negative birefringence which is highly desirable in the disclosed invention.” So a thin crystal film will inherently have negative birefringence. Further regarding claims 15 and 31 Brobov discloses use of thin film polarizers inside liquid crystal displays (see Brobov 139 page 10 last paragraph and also figure 10). At the time the invention was made it would have

been obvious to have used a thin crystal film polarizer in Inoue's liquid crystal display because in doing so benefits include lower light leakage, higher contrast ratio, reduction in size and increased efficiency.

Further regarding claims 2 and 18 Inoue discloses use of a backlight on (see Inoue 50-54) on the rear side of transmittance type displays. It is well known and therefore obvious to incorporate backlights into liquid crystal displays in order to provide good brightness and contrast where ambient light is present. At the time the invention was made it would have been obvious to one skilled in the art to append a backlight on the device because this allows the device operate in a transmittance mode which allows for operation where ambient light is not present.

Further regarding claims 3-5, and 19-21 Inoue discloses a use of a reflective layer on the rear side of the device in order to reflect incident light in a reflective type Liquid Crystal Device (see Inoue item 5 of figure 1 and column 12, 24-28). Reflectors are well known to exhibit the lowest power consumption in LCD displays. Further regarding claims 6-8, and 22-24 Inoue discloses use of a translector in place of a reflective layer in order to (Inoue column 2 lines 44-48). Transflective displays are well know for low power operation but still allow for some operation in situations where ambient light is not present. At the time the invention was made it would have been obvious to one of ordinary skill in the art to include either a translector or reflector in the LCD because

reflective displays allow for extremely low power operation and transfective displays allow for operation where little ambient light exists.

Claims 4-5 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue and Brobov as applied to claim 1 / 17 above, and further in view of Mizobate et. al US Patent No. 6018379. Inoue and Brobov disclose all limitations of the claim except use of either specular or diffusive reflection in the translector / reflector. Mizobate discloses use a reflector with specular reflection and also changing this type of reflection to diffusive via disposing a scattering layer on top (column 3 lines 10, 41-47) in order to meet desired light scattering characteristics. At the time the invention was made it would have been obvious to one of ordinary skill in the art to incorporate specular or diffusive reflection in a transfective / reflective layer in order to meet the necessary light scattering characteristics.

Claims 12-13 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brobov and Inoue as applied to the claims above, and further in view of Blanchard US Pub. No. 20020167811. Brobov and Inoue disclose all limitations of the claims except use of an antiglare or antireflective layer in claims 12 and 28 and also do not disclose use of a diffusive layer in claims 13 and 29. Blanchard discloses use of an antiglare layer to prevent front surface reflection (see paragraph [0031]). Blanchard also discloses use of several diffusers (see paragraph [0029]) to distribute and provide consistent luminosity in the device. At the time the invention was made it would have been obvious to one of ordinary skilled in the art to

incorporate an antiglare layer and a diffuser in Inoe's LCD because the first prevents front surface reflection and the second provides for consistent luminosity.

Claims 9-11 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue and Brobov as applied to claims 1 / 17 above further in view of Fukao US Patent 6211931. Regarding claims 9-11, 25 - 27 Inoue and Brobov disclose all limitations of the claims including using a dichroic dye, however Brobov does indicate whether this dye is composed of aromatic rings, and also interplanar distance along the transmission axis $3.4 \pm .3 \text{ \AA}$. Further regarding claims 10 and 26 Brobov also does not disclose a heterocyclic dye material. Further regarding claims 11 and 27 Brobov does however disclose a dichroic dye capable of forming a stable lyotropic liquid crystal. Fukao US Patent No. 6211931 discloses use of dichroic dyes comprised of aromatic rings in liquid crystal displays to achieve high contrast (see Fukao column 5 lines 34-36). Fukao also discloses a solvent used to dissolve the dichroic dye being heterocyclic (see Fukao column 5 lines 55-60). Brobov does disclose use of dichroic dyes capable of forming lyotropic crystals (see Brobov page 135 paragraph 1). At the time the invention was made it would have been obvious to one of ordinary skill in the art to form lyotropic crystals formed from dichroic heterocyclic dyes because this forms a polarizer with lower light leakage, higher contrast ratio, reduction in size and increased efficiency.

Claims 16 and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue and Brobov as applied to claim 1 / 17 above, and further in view of King et. al. Inoue and Brobov disclose all the limitations of the claim except a thin crystal film polarizer that additional

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functions as a color filter. King discloses a rear-multi-layer RGB-color thin crystal film polarizer capable of reflection, polarization and color filtering. These polarizer provide a thinner more integrated design, improved display performance in terms of viewing angle brightness, lower costs and greater temperature stability. At the time the invention was made it would have been obvious to one skilled in the art to combine the rear-multi-layer RGB-color thin crystal film polarizer with Inoue's LCD device because this provides a thinner more integrated design, improved display performance in terms of viewing angle brightness, lower costs and greater temperature stability.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu Vu whose telephone number is (571)-272-1562. The examiner can normally be reached on 8AM-5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu Vu
Patent Examiner
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/David Nelms/

Supervisory Patent Examiner, Art Unit 2871